GKN AXLES LIMITED

KIRKSTALL DIVISION

PARTS AND SERVICE MANUAL FOR
AXLES FITTED TO
PREVOST 6 X 2 COACH

MANUAL No.1604 Issue A

PARTS AND SERVICE MANUAL FOR AXLES FITTED TO PREVOST 6 X 2 COACH

1st. AXLE TYPE S82
AXLE ASSEMBLY No.25546
CUST. REF. 610985

REF. DRAWING Nos.
Hub F4651A
Instl F4651E

2nd AXLE TYPE TS5
AXLE ASSEMBLY No. 33533
CUST. REF. 621535

REF. DRAWING Nos.
Hub R9056C

Compiled by David Ratcliffe

The description, testing procedures, and specifications contained in this parts / service publication were current at time of printing. This manual will not be updated. If in doubt about any aspect of maintenance or servicing of the axle please contact the vehicle builder or our service department direct.

GKN Axles Ltd. Kirkstall Division reserves the right to discontinue or modify its procedures and to change specifications at any time without notice and without incurring obligation.

The recommendations of the vehicle manufacturer should be considered as the primary source of service information regarding this GKN Axles product. This manual is intended to be used as a supplement to such information.

Any references to brand names in this publication is made simply as an example of the types of tools and materials recommended for use and, as such, should not be considered as an endorsement. Equivalents, if available, may be used.

Axles Ltd. Kirkstall Division - Technical Publications

MANUAL ISSUE SHEET

Page No.	Issue	Description / Alteration	Reason	Date
All	A	New manual		Aug. 94

MANUAL CONTENTS

LUBRICATION INSTRUCTIONS FOR AXLES FITTED TO PREVOST 6 X 2 COACH

MANUAL SECTION A

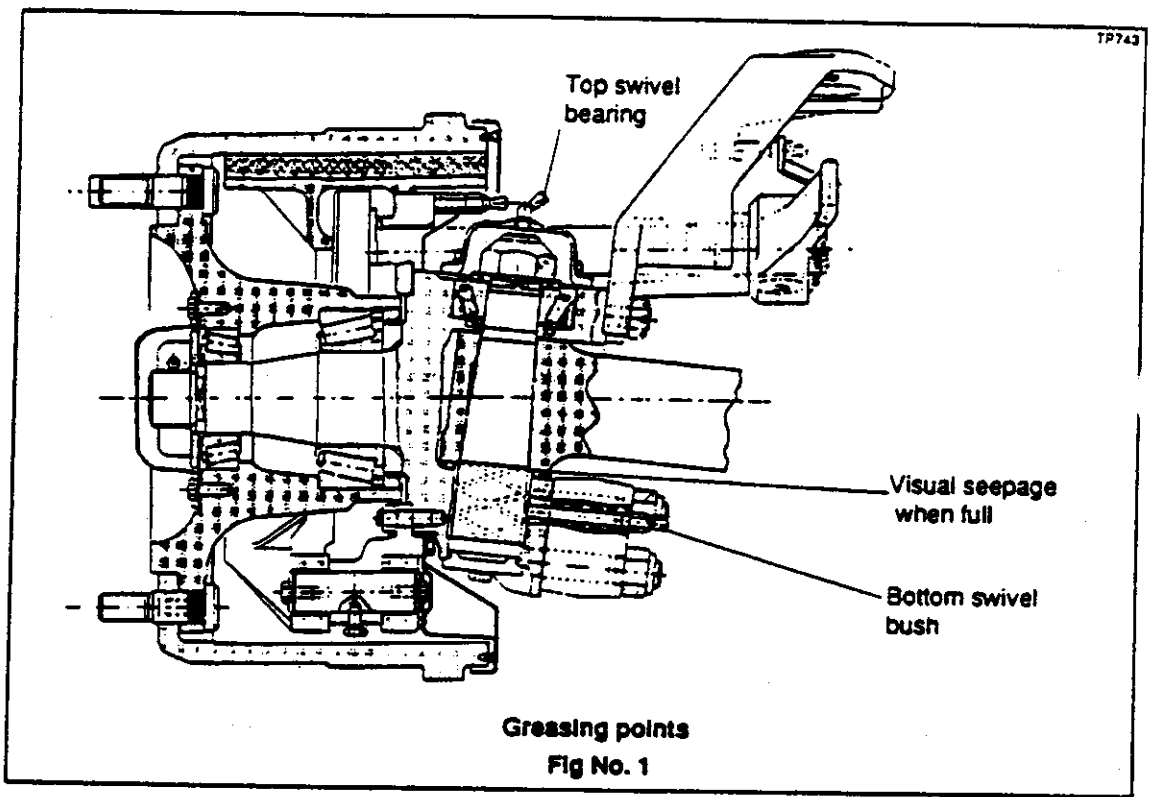
LUBRICATION INSTRUCTIONS FOR TYPE S82 STEER AXLE

1.1 Lubricate the stub axle and socket assemblies with one of the following recommended greases at regular intervals not exceeding 10,000 miles or 6 (six) weeks whichever occurs first at grease points as shown (fig. no.1).

1.2 Clean out and recharge hub & hub bearings every 12 months. See figure no.2 for amount of grease to be used.

Recommended Greases

Lithium base roller bearing grease NLGI - no.2 (Shell Retinax LX or equivalent).



Greasing points
Fig No. 1

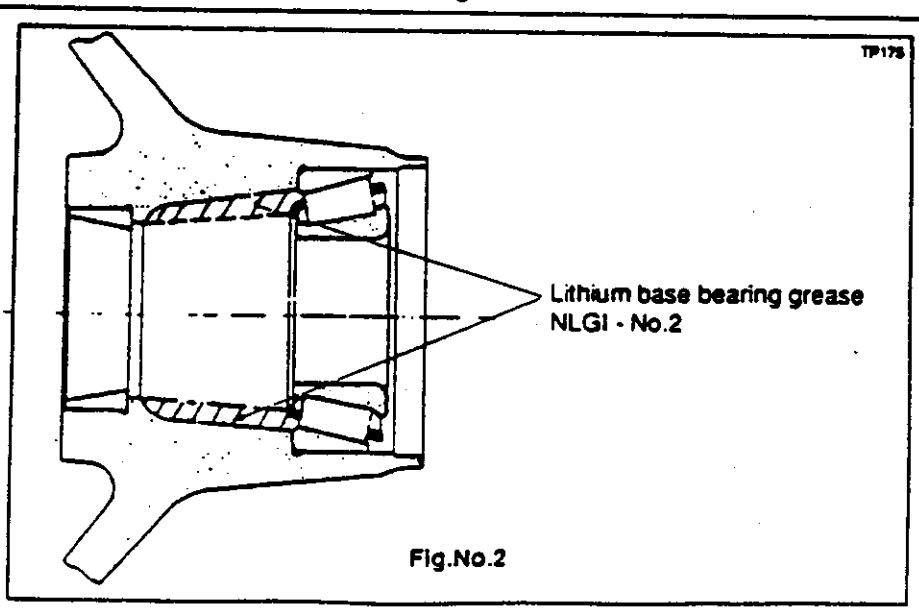


Fig.No.2

LUBRICATION INSTRUCTIONS FOR TS5 HUB UNIT WITH KNORR AIR DISC BRAKE

Clean out and recharge hub & hub bearings every 12 months. See figure no.3 for amount of grease to be used.

Recommended Greases

Lithium base roller bearing grease NLGI - no.2 (Shell Retinax LX or equivalent).

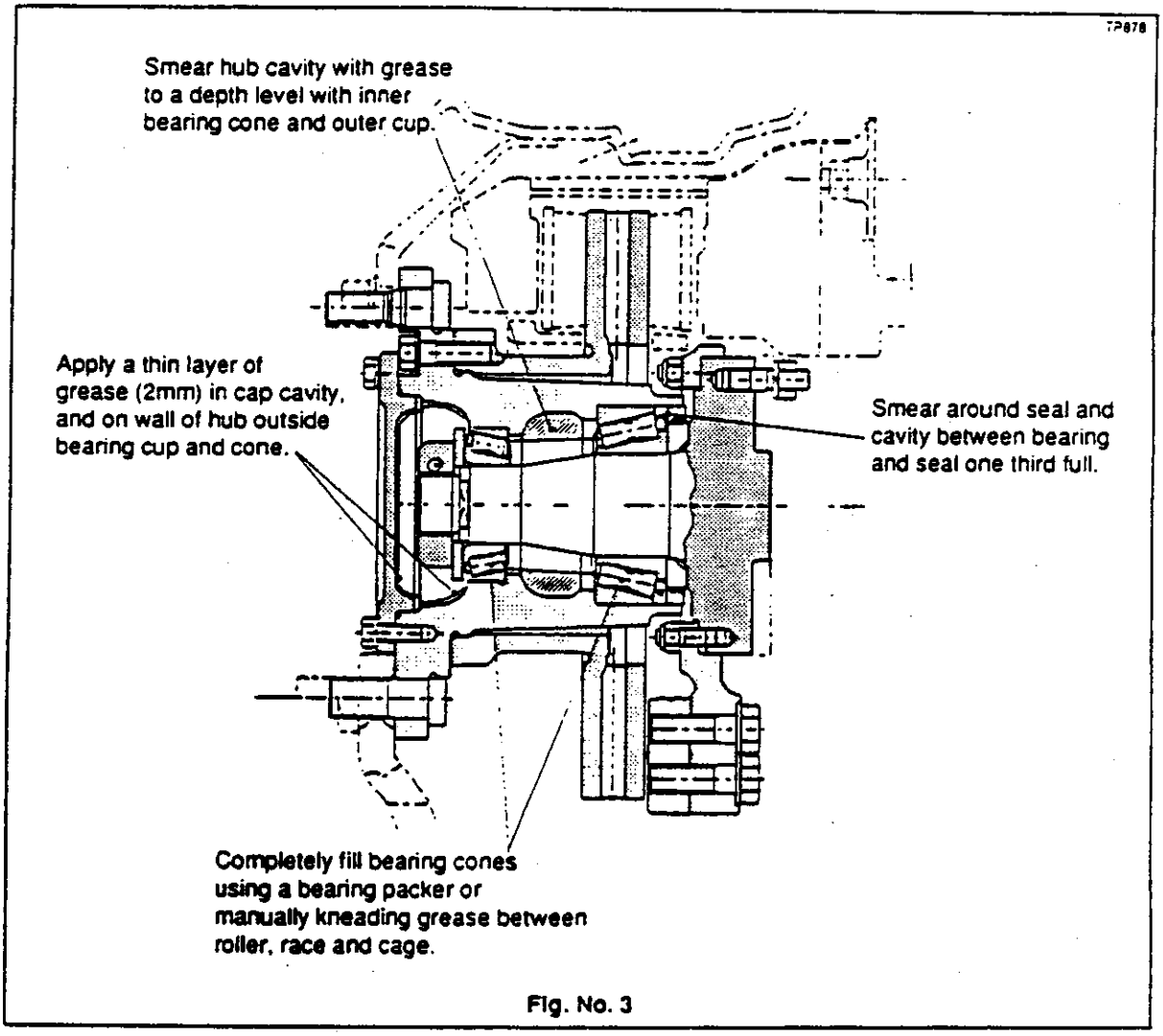


Fig. No. 3

Notes

PARTS AND SERVICE INSTRUCTIONS FOR S82 STEER AXLE WITH KNORR AIR DISC BRAKE

ILLUSTRATION No.F47

MANUAL SECTION B

PARTS AND SERVICE INSTRUCTIONS FOR TYPE S 82 STEER AXLE

DESCRIPTION

The axle is of the 'Reverse Elliot' type comprising a girder section axle bed or beam with stub axles. Each stub axle is carried on a taper king pin, with a steep angle taper roller bearing at its top and a plain phosphor bronze bush at the bottom.

The hub taper roller bearings are of a generous size and, adjusted by means of special split nut with 'D' washer.

Brakes may be of GKN or proprietary manufacture which can be serviced without disturbing the hub.

Steering ball joints with hardened balls and rubbing pads incorporate compression springs which automatically take up any wear.

SECTION 1 ROUTINE MAINTENANCE

1.1 Hub bearing adjustment

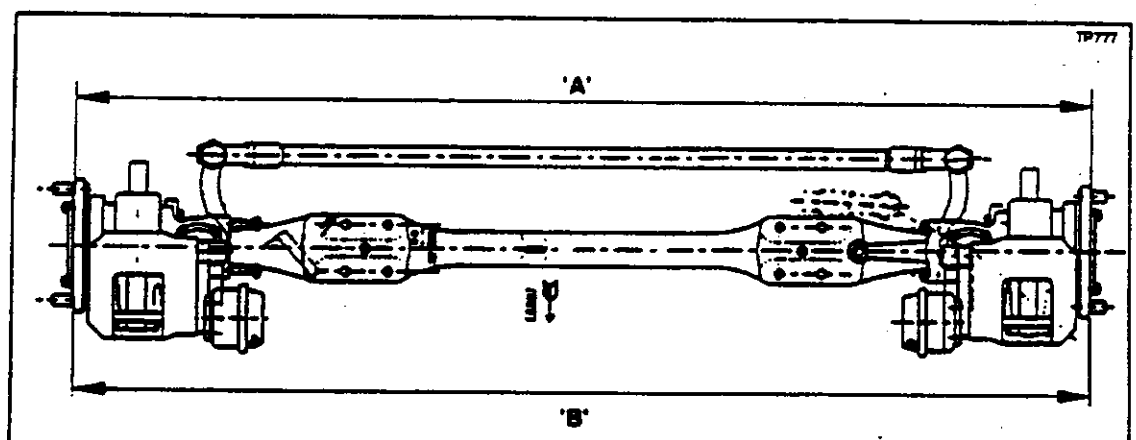
a) An inspection should be made after the first 3,000 miles (4,800 km) and then at intervals of 25,000 miles (40,000km). With the wheels raised they should revolve quite freely without roughness.

b) Hub bearings should have a slight end float movement within the limits 0.0005" to 0.002" when rocked forwards and backwards on axle stub.
See section 8, page B9 if any adjustment is required.

1.2 To check front wheel ' Toe In '

a) To preserve correct steering and avoid excessive tyre wear, tracking (or alignment) of the front wheels should be checked periodically, as follows :-
Set the front wheels in straight ahead position and at points level with wheel centre, measure distance between edges of wheel rims, both in front and behind axle centre. For correct 'Toe In', front measurement 'B' should be 0" to $^1/_{32}$ " smaller than rear measurement 'A'. See fig.no.1.

b) To allow for inaccuracies in wheels, the same check should be made with vehicle moved an equivalent to half of wheel revolution. Any adjustment required can be effected by slackening the clamp bolts in ball sockets and rotating tie (track) rod tube.
After adjustment, tighten clamp bolts to 51 - 62 lbs. ft. (69 - 84Nm.) torque.



Measure dimensions 'A' and 'B' over hub flanges on horizontal centre line. To give correct 'TOE IN' dimension 'A' should be 0" - 1/32" greater than dimension 'B'

Fig. No. 1

SECTION 2 TO REMOVE HUB UNIT

2.1 Chock the appropriate wheels.
2.2 Whilst road wheels are still on ground, loosen wheel nuts (7 posn.) slightly
2.3 Raise vehicle, remove road wheel nuts and remove road wheels.
2.4 Disconnect air line from brake caliper (13).
2.5 Remove brake caliper setscrews with washers (16 & 15) then lift off brake caliper assembly (13).
2.6 Remove hub cap setscrews and washers (1 & 2).
2.7 Remove hub cap (3) with 'O' ring(4) then discard 'O' ring.
2.8 Remove hub bearing pinch bolt nut (5) and bolt (66), then remove hub bearing nut (67) along with hub bearing washer (6).
2.9 Remove hub (8) complete with its bearings (11/11A & 64/64A) and oil seal (12) then lift off outer bearing cone (64A).
2.10 Remove oil seal (12) and inner bearing cone (11A) from hub (8) .
2.11 Drive out hub bearing cups (11 & 64) from hub (8).
2.12 If hub bearing distance piece (oil seal wear sleeve) (60) shows signs of wear or corrosion it must be removed and replaced with a new part.

SECTION 3 TO REMOVE THE STUB AXLE ASSEMBLY

3.1 Remove split pin (46) followed by nut (47) with washer (48), then separate ball socket (39) from bottom lever (49) with suitable ball pin extractor.
Note :- When separating ball joint from steering lever, an extractor tool MUST be used. DO NOT strike areas around ball pin tapers with hammer blows under any circumstances due to possible ball pin taper deformation.

3.2 Remove swivel top cap setscrews and washers (25 & 24), enabling swivel top cap (23) to be removed.
3.3 Remove sealant from top cap and swivel mating faces (23 & 58) using Loctite ' Chisel Gasket Remover ' or by carefully scraping sealant from faces .
3.4 Remove bottom cap setscrews and washers (53 & 54).
3.5 Pull off swivel bottom cap (55) then remove sealant from bottom cap and swivel mating faces (55 & 58) using Loctite ' Chisel Gasket Remover ' or by carefully scraping sealant from faces .
3.6 Remove swivel pin nut and washer (22 & 21).
3.7 Give axle beam (37) a sharp tap to loosen swivel pin (56). The swivel pin (56) can then be driven out downwards, thus releasing it from axle beam.
3.8 The swivel assembly can be removed from axle beam (58).
3.9 Take out swivel pin bearing (20/20A), swivel bearing adjustment shims (19), swivel bearing sleeve (17) and swivel pin oil seal (18) from top of swivel (58).
3.10 Take out swivel bush seal (52) and swivel pin bush (57) from bottom of swivel (58).
3.11 Remove bottom lever nuts (42), then pull off bottom lever (49).
Care must be taken not to damage bottom lever studs (50 & 51).
3.12 Check the condition of swivel stop nut (33), and adjusting washer (32), removing for replacement if required.

Inspection

Thoroughly clean all parts, inspect for wear and renew if required.

SECTION 4 DISMANTLING BALL SOCKET SEE FIG No 2.

4.1 Remove dirt seal (15) also dirt seal (pressing) (16) from ball pin.
4.2 Slacken pinch bolt nut (10) then unscrew and remove ball socket assembly from tie rod having first marked ball socket body and tie rod to enable tracking on re-assembly.
4.4 Remove adjuster split pin (9) from ball socket body (3).
4.5 Remove cap (8) then using a suitable tool ie: a piece of 1 " x $^{1}/_{8}$ " x 9 " flat bar, unscrew and remove adjusting piece (7). Waggle ball (2) to free thrust cap (5).
4.6 Remove compression spring (6) also thrust cap (5) from ball socket body.
4.6 Relieve peening on socket body top (3) then using a hide faced mallet, tap ball pin (2) out of body. This operation will also remove cover plate (1) from body (3).
4.7 The rubbing pad (4) can now be removed from body (3).

Thoroughly clean all parts and check for wear, renewing where necessary.

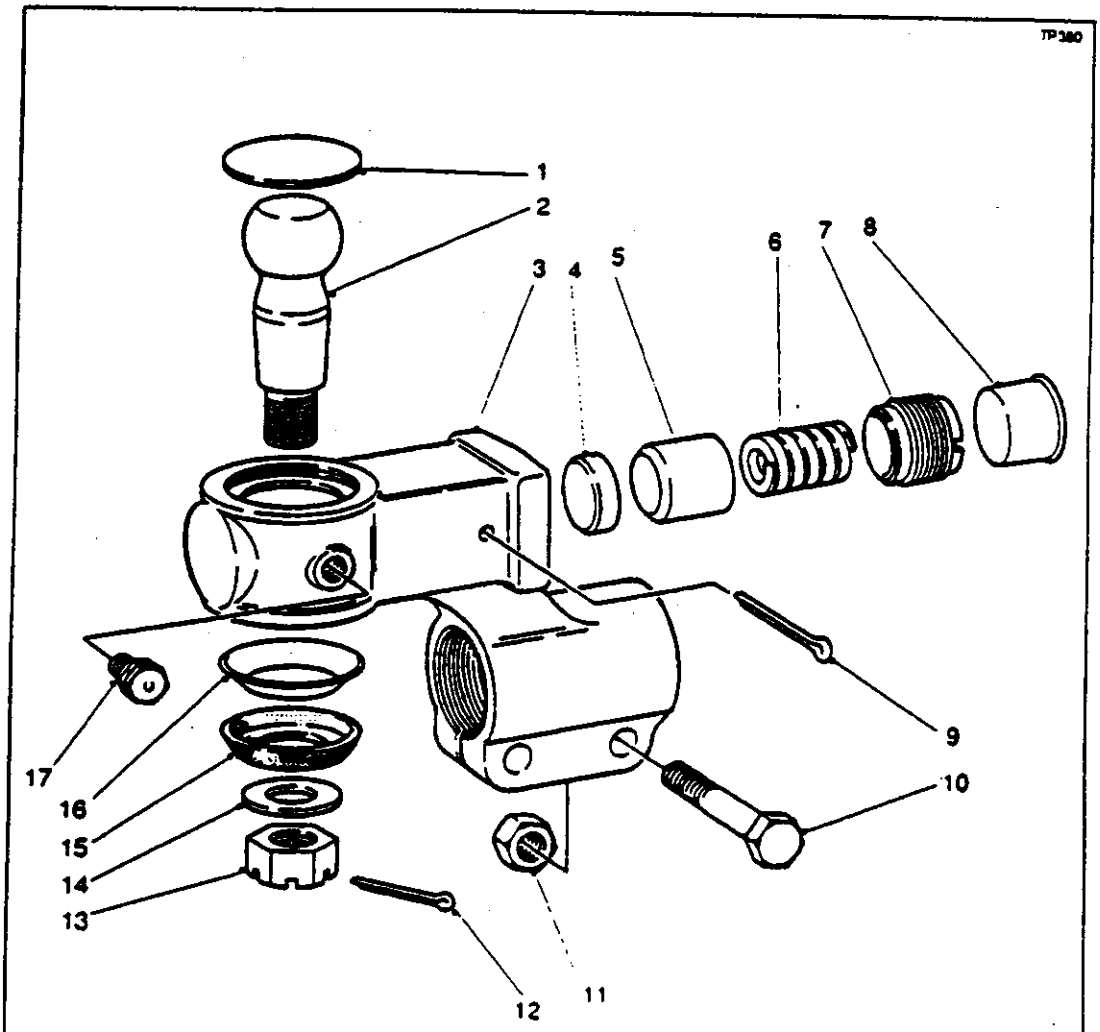


Fig. No.2

SECTION 5 ASSEMBLY OF BALL SOCKET AND TIE ROD Fig No 3.

Note :- Method of assembling ball socket is same for drop type shown and alternative straight body type.

5.1 Apply a bead of Loctite 638 sealant to mating corner of rubbing pad (4) in socket body (3) then knock rubbing pad (4) into its recess in ball socket body.

5.2 Thoroughly grease rubbing pad (4) and ball pin (2) with Shell 'Retinax LX' or equivalent.

5.3 Insert ball pin (2) into body.

5.4 Insert thrust cap (5), compression spring (6) and adjuster piece (7) into body.

5.5 Using a suitable tool ie: a 1" x $^{1}/_{8}$" x 9" long flat bar, tighten adjuster piece (7) fully home (SOLID) locating thrust cup (5) onto ball pin (2).

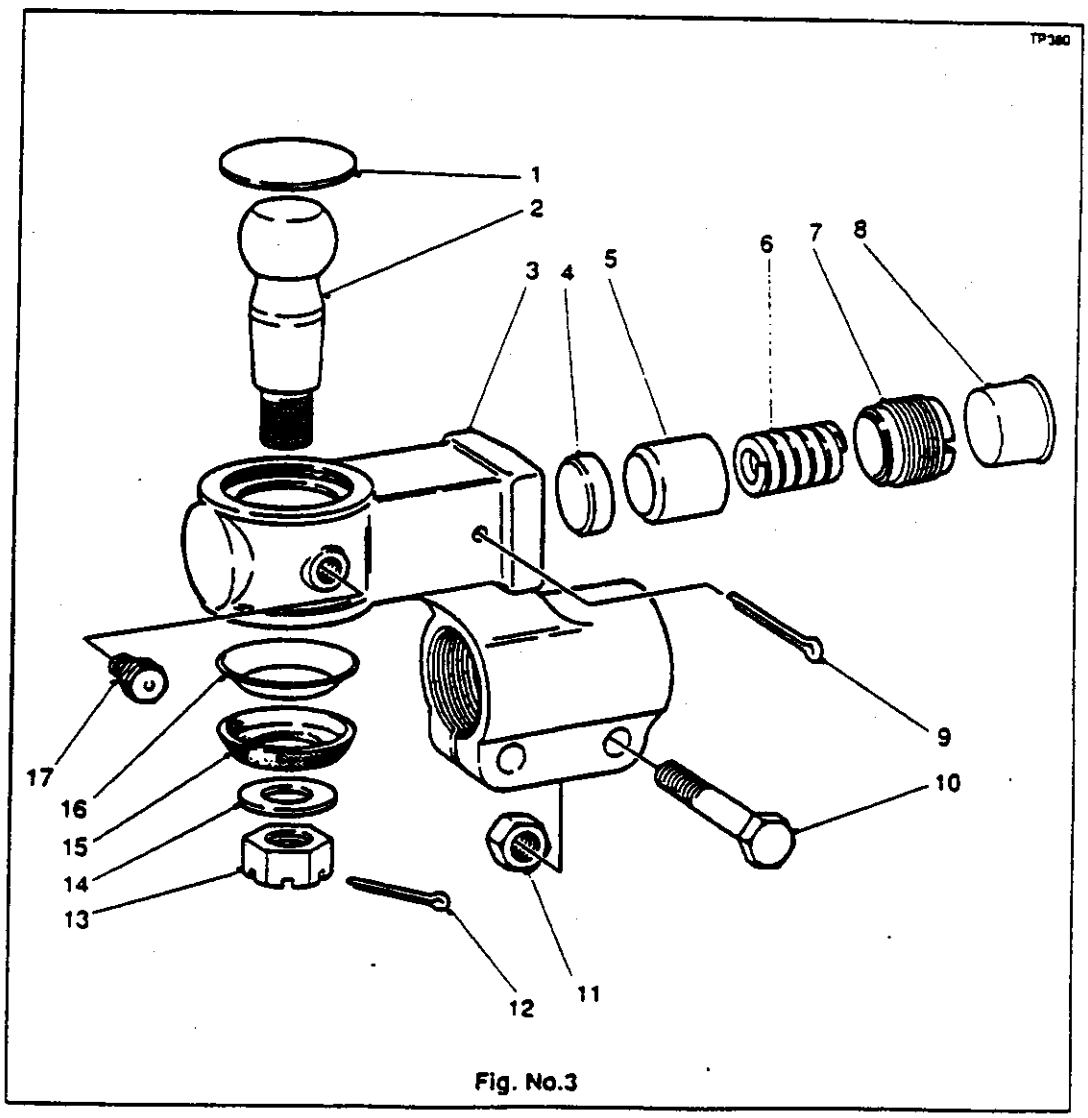


Fig. No.3

SECTION 5 ASSEMBLY OF BALL SOCKET AND TIE ROD Cont.

5.7 Still with tool located on adjuster piece (7), back off carefully (LEAST AMOUNT) until adjuster piece split pin (9) is allowed to pass through body, and that ball pin shank can be moved by force of hand, then remove tool.

Note :- **If ball pin (2) does not rotate when re-adjusted in line with above instructions, this suggests that ball pin has local worn flats as shown in fig.no.4. In this instance ball pin (2), thrust cup (5) and rubbing pad (4) MUST be replaced, if not FAILURE could occur in service, ie ball pin (2) not being able to move in assembly when turning from lock to lock as shown in fig 5.**

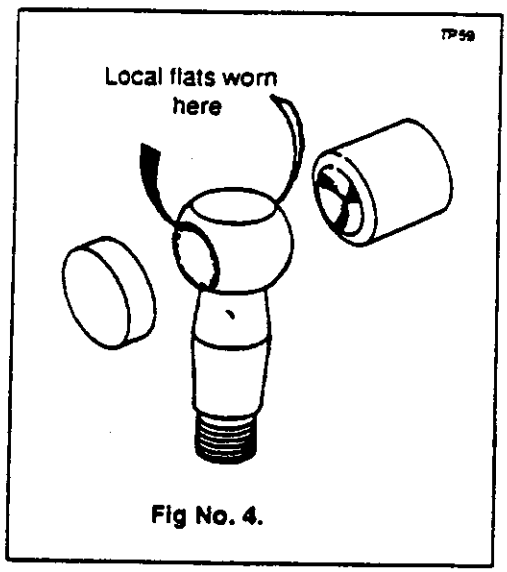


Fig No. 4.

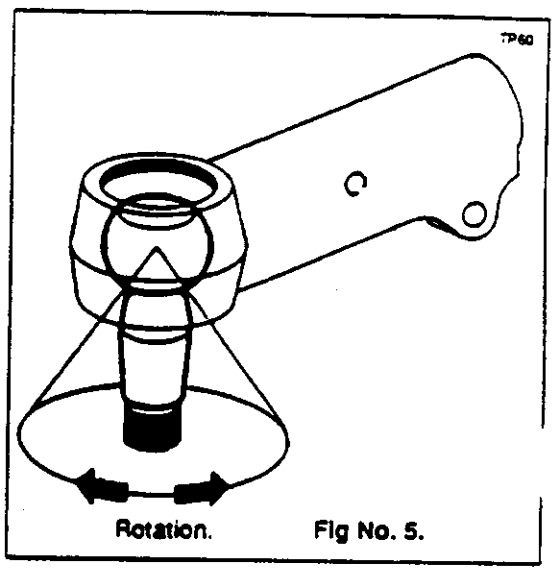


Fig No. 5.

5.8 Fit cover plate (1) into top of ball socket body, re-peen using a cold chisel to secure.

5.9 Screw assembled ball socket onto tie rod. Lining up marks on both body and tie rod previously made, or retracking using manual instructions.

5.10 Fit pinch bolts (10) and nuts (11) then ighten nuts (11) alternately and progressively to 65 - 75lbs.ft. (88 - 102Nm.) thus securing ball joint to tie rod.

5.11 Fit dirt seal (pressing) (16) and dirt seal (rubber) (15) onto ball pin (2).

5.12 Locate ball socket and tie rod assembly with steering lever, carefully align and fit ball pin (2) into hole in steering lever.

Note :- **Ball pin (2) and ball pin tapers in bottom steering levers (49 - F47) must be clean, dry and free from oil prior to assembly.**

5.13 Fit pin washer (14) onto ball pin (2).

5.15 Screw pin nut (13) onto ball pin (2) then tighten to 175 lbs. ft. (237Nm.) torque.

5.16 Using a 2lb hammer, tap steering lever to 'Shock' ball pin (2) into taper hole.

5.17 Re-torque pin nut (13) to 175 lbs. ft. (237Nm)

5.18 Fit split pin (12), if slot / hole are not in line, adjust up to next slot.

100 Lbs (136 Nm) 170Lbs (231 N.m) N.Leonard

Min pin nut torque 175 lbs. ft. (237Nm.). Max pin nut torque ~~200 lbs~~. ft. (271Nm)

5.19 Re-charge ball socket with Shell 'Retinax LX' or equivalent grease through lubricator (17).

SECTION 6 REFITTING SWIVEL ASSEMBLY

6.1 Prior to assembly, pack swivel pin bearing (20/20A) with lithium base grease (Shell Retinax LX or equivalent) using a bearing packer or manually knead grease between rollers, race and cage.

6.2 Coat all internal surfaces / parts with clean gear oil.

6.3 Fit swivel pin top oil seal (18), open side first, into position in top swivel bore (58).

6.4 Fit swivel pin bearing cup (20) into position in swivel bore (58).

6.5 Press swivel pin bottom bush (57) into position in swivel bore (58) flush with bottom face of swivel.

6.6 Fit swivel bush seal (52) onto the protruding diameter of swivel pin bottom bush (57) then place dirt excluder (78) into position over seal.

6.7 Position swivel assembly onto axle beam (37).

Note :- care must be taken during this operation so as not to roll or trap swivel bush seal (52).

Suggest a thin piece of card or plastic placed on seal during this operation.
Make sure that swivel pin bore is free of burrs and corrosion, then grease bore with multi purpose chassis grease.

6.8 Drive swivel pin (56) through swivel (58) and axle beam (37).

6.9 Lubricate swivel pin bearing sleeve (17) with clean oil / grease then fit over protruding swivel pin (56), large chamfer first to locate in oil seal bore (18) and abut axle bed (37).

6.10 Select swivel bearing adjustment shims (19) with a total thickness of approximately 0.020 " and place in position on top swivel bearing sleeve (37).

6.11 Fit swivel pin cone (20A) into swivel pin bearing cup (20)

6.12 Fit swivel pin washer (21) and swivel pin nut (22) then tighten nut to 500 - 700 lbs. ft. (678 - 949Nm.)

6.13 Using a 7/14 lb hammer, shock load axle beam (37) on forged end area.

SECTION 7 SWIVEL BEARING ADJUSTMENT

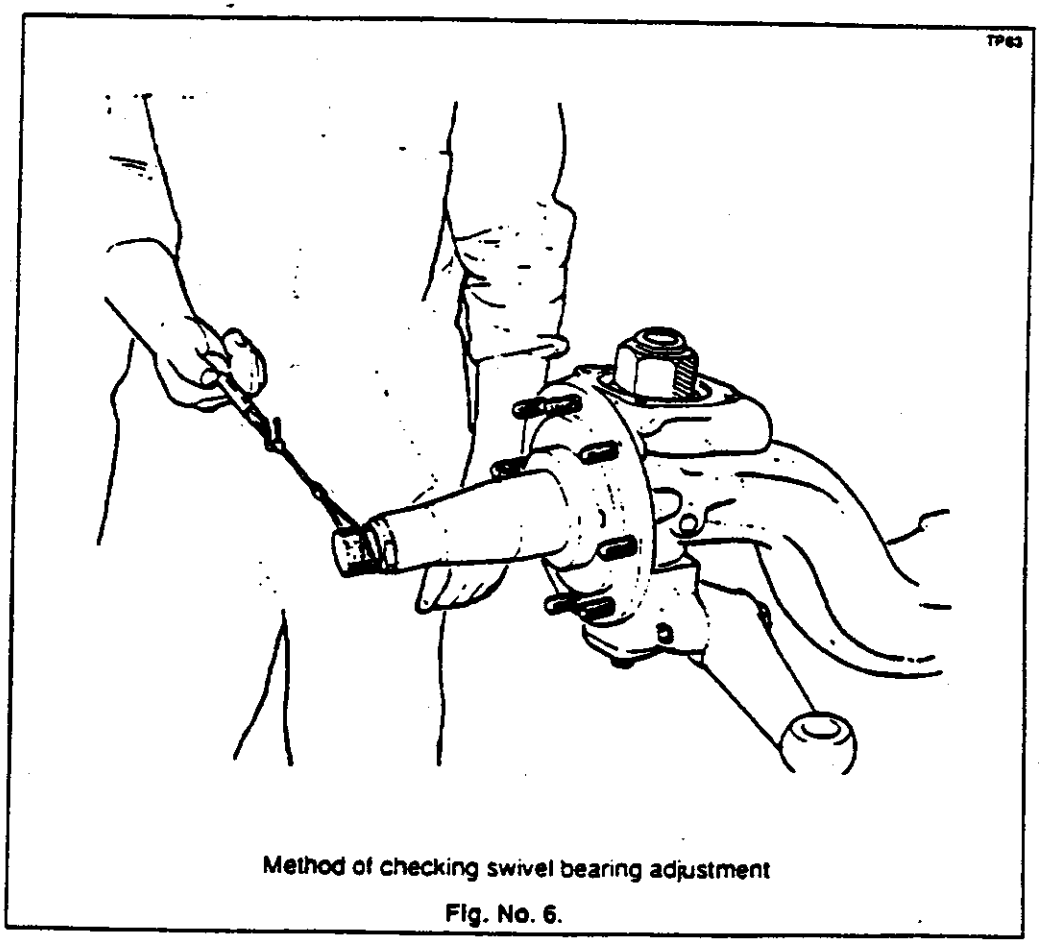
7.1 With nominal shim (19) thickness of 0.020 " placed between bearing (20/420A) and bearing sleeve (17), attach a cord and spring balance capable of reading 25 lbs (11 $^{1}/_{2}$ kg) to end of stub axle (58) as shown in fig. no. 6.
Pull swivel from lock to lock, noting spring balance reading, ignoring the force needed to start movement. The correct reading should be between 12 to 24 lbs. (5.5 to 11kg.) pull giving 10 - 20 lbs ft. (13.6 - 27Nm.)
If the reading is outside these limits, it will be necessary to alter shim thickness (39) between bearing cone (20A) and its sleeve (17).

To increase the load required, remove shims from nominal pack.

To decrease the force required, add shims to the nominal pack.

Add or subtract shims as required until a reading of 10 - 20 lbs. ft. (13.6 - 27Nm.) is obtained.

7.2 When swivel is set correctly, check that swivel pin nut (22) is tightened to 500 - 700 lbs. ft. (678 - 949Nm.) torque .



Method of checking swivel bearing adjustment

Fig. No. 6.

SECTION 8 SWIVEL FINAL ASSEMBLY

8.1 Apply a thin layer ($^{1}/_{16}$" - 1.5mm) of lithium base grease (Shell Retinax LX or equivalent) to the inside of swivel top cap (23).

8.2 Clean top cap and swivel mating faces (23 & 58) with Loctite Superclean Safety Solvent no.706 or other suitable chlorinated solvent then apply a complete 1/8" bead of Loctite Superflex (black) around base of top cap (23) before fitting to swivel (58) within 5 minutes of applying Loctite. See fig. no.3

8.3 Secure top cap (23) with swivel top cap setscrews and washers (25 & 24) and tighten to 51 - 62 lbs. ft. (69 - 84Nm.).

8.4 Clean bottom cap and swivel mating faces (55 & 58) with Loctite Superclean Safety Solvent no.706 or other suitable chlorinated solvent then apply a complete 1/8" bead of Loctite Superflex (black) around base of bottom cap (55) before fitting to swivel (58) within 5 minutes of applying Loctite. See fig. no.7

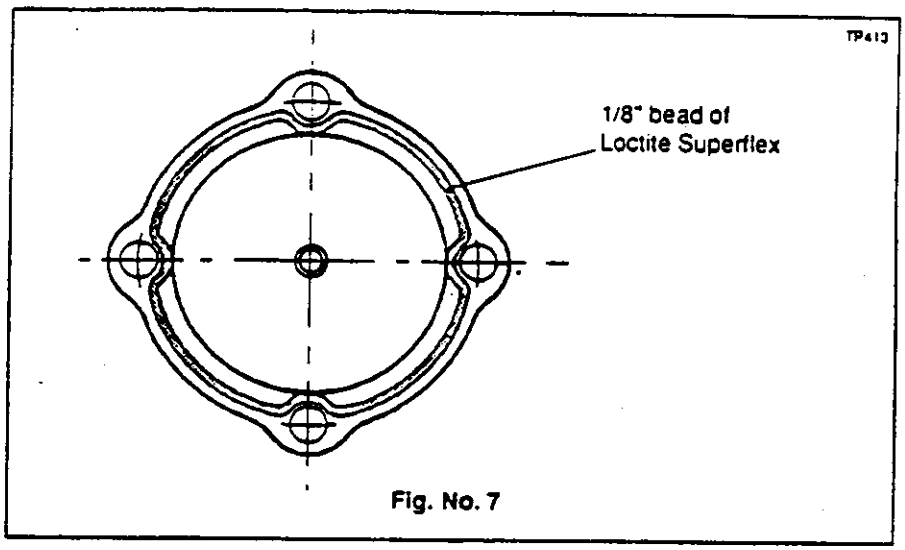


Fig. No. 7

8.5 Secure bottom cap (55) with swivel bottom cap setscrews and washers (53 & 54) then tighten to 26 - 32 lbs. ft. (33 - 35Nm.).

8.6 Check tightening torque of bottom lever studs (50 & 51) is within limits of 190 - 210 lbs ft. (258 - 285Nm.).

8.7 Locate bottom steering lever (49) onto studs (50 & 51). then fit steering lever nuts (42) and tighten to 190 - 275 lbs. ft. (258 - 353Nm.).

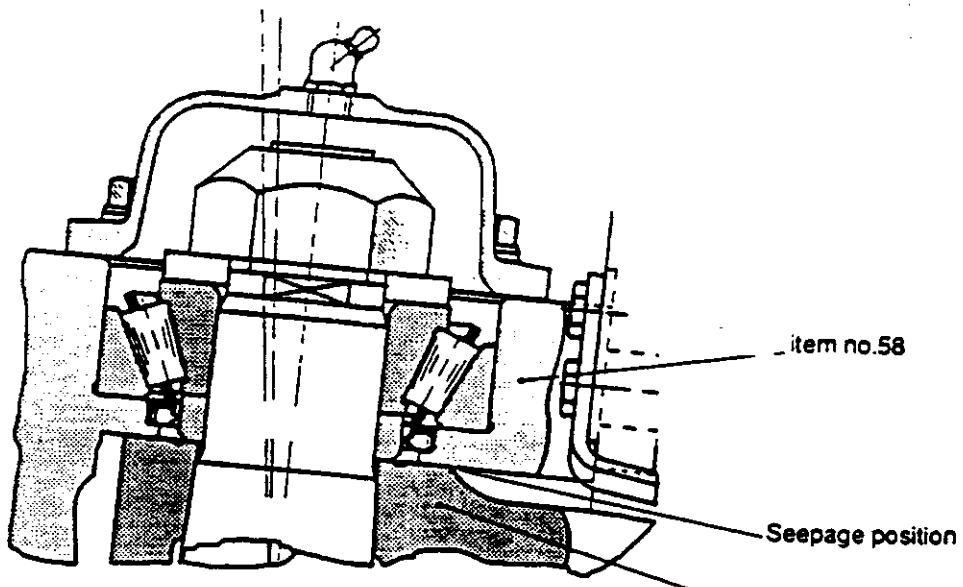
8.8 Check that tightening torque of top steering lever studs (28) is between limits 190 - 210 lbs ft. (258 - 285Nm.).

8.9 Fit top steering lever (29) onto studs (28) then fit nuts (30) and tighten to 190 - 275 lbs.ft. (258 - 353Nm.).

8.10 Fit new lubricators (26 & 44) with protective caps (27 & 43) into their respective positions in swivel top cap (23) and bottom steering lever (49).

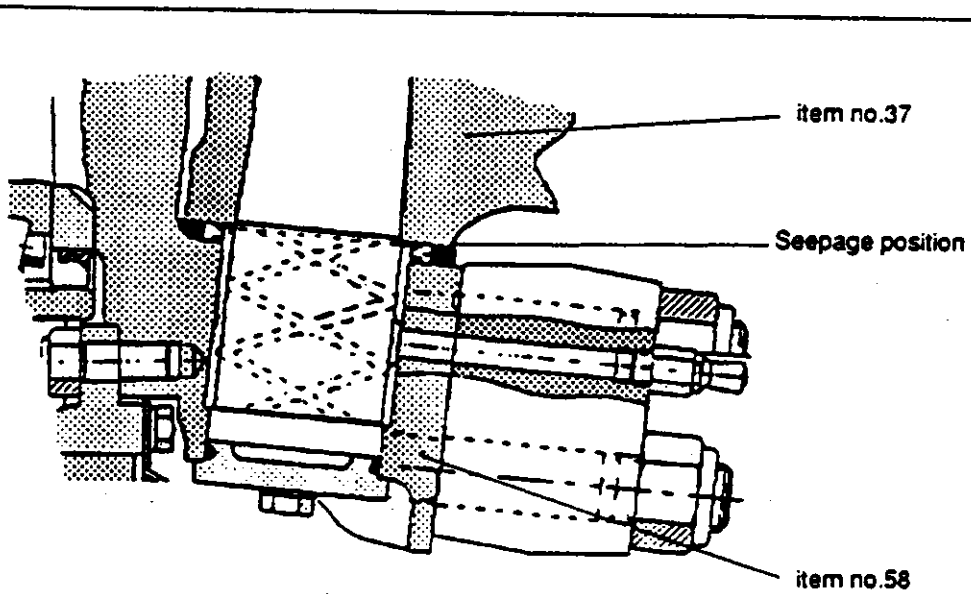
SECTION 8. SWIVEL FINAL ASSEMBLY Cont.

8.12 Charge swivel assembly with grease.
Swivel is full when grease seeps from between upper face of axle beam (37) and swivel jaw (58) in top half (see fig. no. 8) and from between swivel oil seal (56) and lower face of axle beam (37) (see fig. no.9).



Part section thro' top of swivel showing grease seepage position when full.

Fig. No. 8



Part section thro' bottom of swivel showing grease seepage position when full.

Fig. No. 9

8.13 Reconnect ball socket and tie rod (39 & 38) to steering lever (49).

Note :- Ball pin (39) and ball pin tapers in bottom steering levers (49) must be clean, dry and free from oil prior to assembly.

SECTION-9 TO ASSEMBLE THE HUB

Prior to assembly, pack hub bearing (11/11A & 64/64A) with lithium base grease (Shell Retinax LX or equivalent) using a bearing packer or manually knead grease between rollers, race and cage.

9.1 Fit hub bearing distance piece (60) onto swivel stub axle (58).

9.2 Fit inner and outer hub bearing cups (11 & 64) onto their bores in hub (8).

9.3 Fill hub cavity with lithium base grease (Shell Retinax LX or equivalent) from outer bearing shoulder to centre line of inner bearing cone as shown in figure no.10.

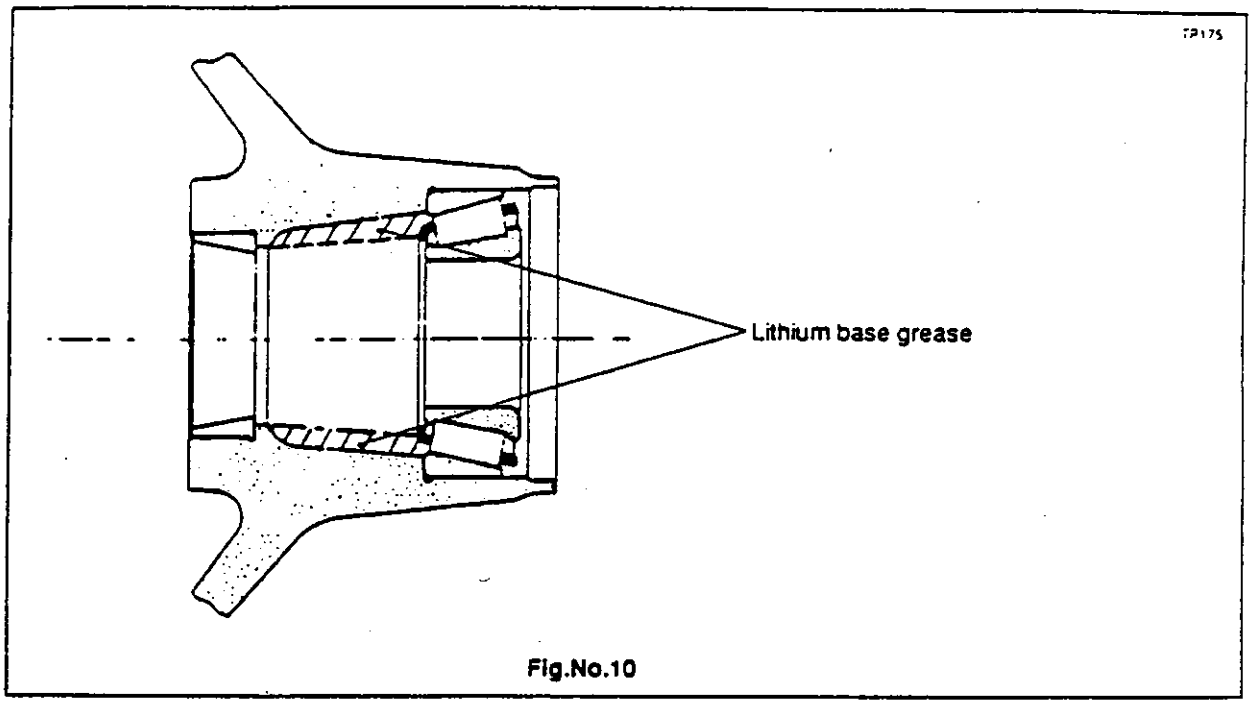


Fig.No.10

9.4 Fit inner hub bearing cone (11A) into its cup in hub (8).

9.5 Press hub oil seal (12) into position in hub (8)using a suitable bumper tool which locates on outer part of seal to prevent damage on assemble.

9.6 Fit hub assembly onto swivel stub axle (58).

9.7 Fit outer bearing cone (64A) into its cup (64).

9.8 Fit hub bearing washer and hub bearing nut (6 & 67). Tighten nut hard with the aid of a small tommy bar just enough to take up bearing slack.

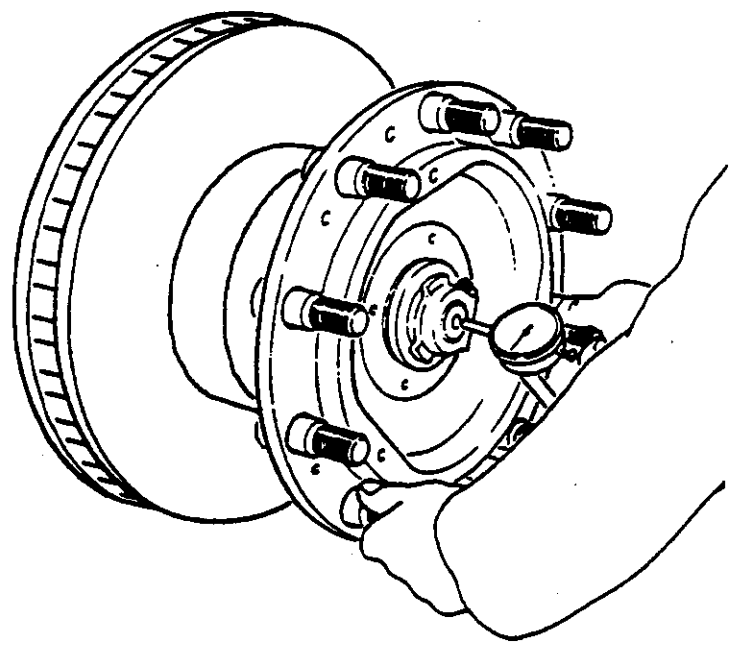
9.9 Fit hub bearing nut pinch bolt and nut (66 & 5), tighten finger tight.

SECTION 9 TO ASSEMBLE THE HUB Cont.

9.10 Adjust hub 'End Float' as follows :-
Rotate hub and using a hide faced mallet, knock hub backwards and forwards along axle arm to 'Shock Load' and thus settle bearings in position.

Note :- **It is very important to rotate and ' shock load ' the hub because :-**

a) The rotation serves to ensure that bearing rollers settle into running in their correct tracks.
b) The ' Shock Load ' is to ensure that bearings are seated correctly up to their abutment shoulders.
Test the tightness of hub bearing nut (67), if loose, re-tighten hard.
Rotate and ' Shock Load ' the hub again.
Continue this procedure until hub bearing nut (67) cannot be tightened further after hub has been rotated and ' Shock Loaded '.
Back off hub bearing nut (67) by approximately 30° then rotate again and knock hub outward along axle arm to release bearings.
Mount a dial indicator on hub flange (8) and position its pointer on end of axle stub (see fig. no. 11.).
Rock the hub backwards and forwards along axle arm, taking a reading on dial indicator.
The correct ' End Float ' is between limits 0.0005 " to 0.002 " (0.013 to 0.050 mm).
Tighten the hub bearing pinch bolt nut (5) to 24 - 26 lbs ft. (33 - 35Nm.).
Check the ' End Float ' again, using above procedure, and adjust if outside specified limits.



To adjust hub 'End Float'
Fig.No.11.

SECTION 9 TO ASSEMBLE THE HUB Cont.

9.11 Smear the inside of hub cap (3) with a thin coating of grease as indicated in lubrication section A, page no.A3.

9.12 Clean hub cap and hub mating faces (3 & 8) with Loctite Superclean Safety Solvent no.706 or other suitable chlorinated solvent then apply a complete 1/8" bead of Loctite Superflex (black) around mating face of hub cap (3). See fig. no. 12.

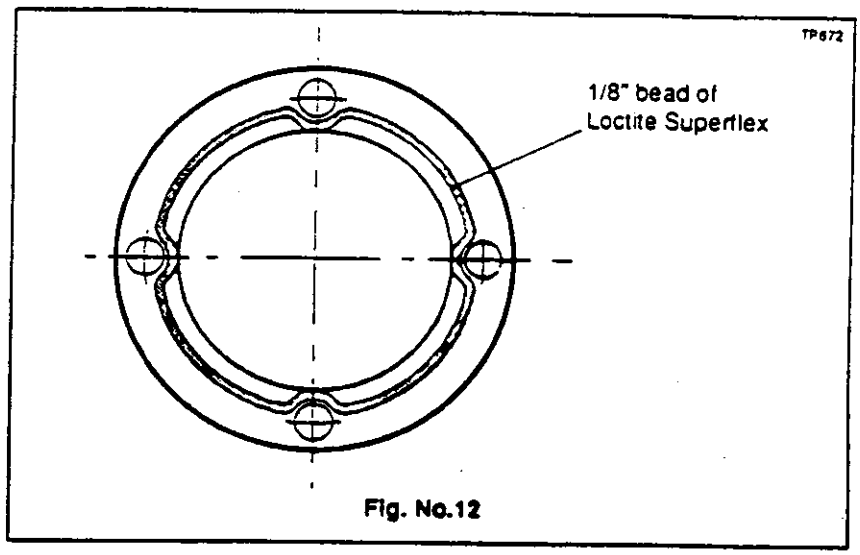


Fig. No.12

9.13 Fit hub cap along (3) within 5 minutes of applying sealant then secure with hub cap setscrews and washers (1 & 2) tightening setscrews to 85 - 103 lbs. ft. (115 - 140Nm.).

SECTION 10 FINAL ASSEMBLY

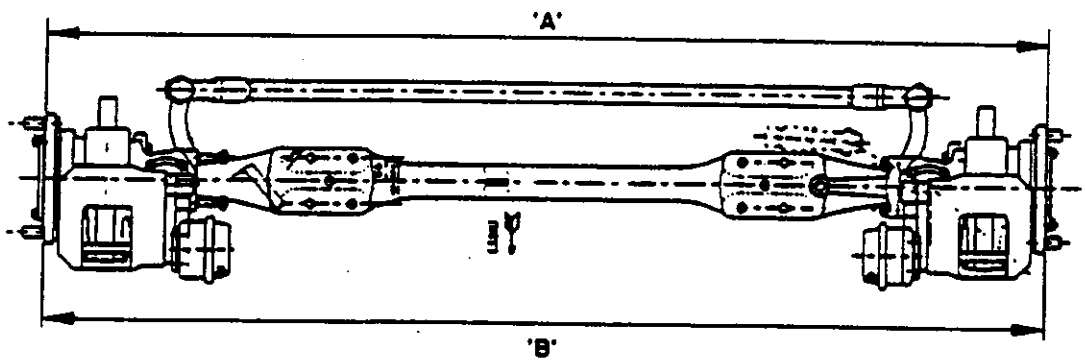
10.1 Refit road wheels, securing with wheel nuts (7 posn.).
Tighten nuts to 475 - 525 lbs. ft. (644 - 712 Nm).

10.2 Check axle supports then lower vehicle to ground.

10.3 Remove chocks and jacks.

10.4 Check wheel alignment as follows:-
Set the wheels in a straight ahead position, and at points level with wheel centre, measure distance between edges of wheel rims both in front and behind axle centre.
For correct alignment the front measurements should be 0" to $^{1}/_{32}$" smaller than that of rear
ie : 'Toe In' to allow for inaccuracies in the wheels, the same checks should be made with vehicle moved so that wheels have moved a further half a revolution (see fig. no.13)
Adjust if required by slackening ball joint clamp bolts and rotating track rod tube.

DO NOT forget to re-tighten the clamp bolts to 51 - 62 lbs. ft. (69 - 84Nm.) after adjusting.



Measure dimensions 'A' and 'B' over hub flanges on horizontal centre line. To give correct 'TOE IN' dimension 'A' should be 0" - 1/32" greater than dimension 'B'

Fig. No.13

TORQUE TABLE FOR S 82 STEER AXLE WITH KNORR AIR DISC BRAKE

Item No	Description	Torque
1	Hub cap setscrew	85 - 103 lbs ft (115 - 140 Nm)
5	Hub pinch bolt nut	24 - 26 lbs ft (33 - 35 Nm)
7	Wheel nut	475 - 525 lbs. ft. (644 - 712 Nm)
16	Brake caliper setscrew	310 - 340lbs. ft. (420 - 461Nm)
22	Swivel pin nut	500 - 700lbs.ft. (678 - 949Nm.)
25	Top cap setscrew	51 - 62 lbs. ft. (69 - 84 Nm)
28	Top Lever stud	190 - 210 lbs. ft. (258 - 285 Nm)
30	Top Lever nut	190 - 275 lbs. ft. (258 - 373 Nm)
31	Caliper bracket nut	85 - 103lbs.ft. (115 - 140Nm.)
42	Bottom lever nut	190 - 275 lbs ft (258 - 373 Nm)
47	Ball socket nut	100 - 170 lbs ft (136 - 231Nm)
50 & 51	Bottom lever stud	190 - 210 lbs ft (258 - 285 Nm)
53	Bottom cap setscrew	26 - 32 lbs ft (35 - 43 Nm)
59	Caliper bracket stud	51 - 62lbs. ft. (69 - 84Nm.)
62	Caliper bracket nut	85 - 103lbs.ft. (115 - 140Nm.)

PARTS LIST FOR S82 STEER AXLE (WITH KNORR DISC BRAKE)

CUSTOMER PREVOST

AXLE ASSEMBLY No.

ILLUSTRATION No.F47

Item No	Description		Qty.Per Axle	Part No.	Recommended Spares Holding Per 25 Axles	50 Axles	100 Axles
1	Hub cap setscrew		8	ML6012/35S	8	8	16
2	Hub cap spring washer		8	ML5712/1	8	8	16
3	Hub cap		2	F4651/29	2	4	6
4	Hub cap 'O' ring		2	R9434/149	2	2	4
5	Bearing nut pinch nut		2	SL228/4	2	4	6
6	Hub bearing 'D' washer		2	7786/30	2	4	6
7	Wheel stud protective cover		20	R9855/161			
8	Hub		2	F4651/28	2	4	6
9	Wheel stud RH		10	F4561/75	30	60	120
	Wheel stud LH		10	F4561/76	30	60	120
10	Pole wheel		2	F4651/100	2	4	6
11	Hub outer bearing cup	Kit no.	2	SL289/107	4	8	16
11A	Hub outer bearing cone	17899/1	2	SL289/286	4	8	16
12	Hub oil seal		2	7786/32	4	8	16
13	Brake caliper RH		1	SM486/2K	1	2	3
	Brake caliper LH		1	SM486/3K	1	2	3
14	Caliper mounting bracket RH		1	F4651/86	1	2	3
	Caliper mounting bracket LH		1	F4651/87	1	2	3
15	Brake caliper retaining washer		12	N70040	12	12	24
16	Brake caliper retaining bolt		12	N70251	12	12	24
17	Swivel pin bearing sleeve		2	7662/19	2	4	-
18	Swivel pin oil seal		2	F4350/32	4	8	
19	Adjusting shim (0.005")		min	4493/119	6	12	
	Adjusting shim (0.010")		as	4493/119A	6	12	24
	Adjusting shim (0.015")		reqd	4493/119B	6	12	24
	Adjusting shim (0.008")		-	4493/119D	6	12	24
	Adjusting shim (0.006")		-	4493/119E	6	12	24
20	Swivel bearing cup	Kit no.	2	SL289/47	4	8	16
20A	Swivel bearing cone	17898/75	2	SL289/48	4	8	16
21	Swivel pin 'D' washer		2	7433/30	2	4	6
22	Swivel pin nut		2	F4330/15	2	4	6
23	Top cap		2	F4561/16	2	4	6
24	Top cap setscrew spring washer		8	SL241/5	8	8	16
25	Top cap setscrew		8	SL554/4	8	8	16
26	Lubricator		2	SL1000/1	2	2	4
27	Lubricator protective cap		2	SL1000/76	2	2	4
28	Top steering lever stud LH		2	SL778/11	2	2	4
	Top steering lever stud RH		2	SL778/21	2	2	4
29	Top lever (LH)		1	F4651/9	1	2	3
30	Top lever nut		4	SL222/9	4	4	8
31	Brake caliper bracket nut		6	SL228/6	6	6	12
32	Stop screw adjusting washer		as	SL246/151	6	12	24
	Stop screw adjusting washer		reqd	SL246/152	6	12	24
	Stop screw adjusting washer		-	SL246/153	6	12	24
	Stop screw adjusting washer		-	SL246/269	6	12	24
33	Swivel stop screw LH		1	7903/44A	1	2	3
	Swivel stop screw RH		2	7903/44G	2	4	6
34	Supplied within item 58						
35 & 36	Not required on this application						
37	Axle bed		1	F4651/1	1	2	-
38	Tie rod (assy with itm 39 - 25632/1)		1	F4560/12			
39	Socket assembly		1	25630			
	Socket assembly		1	25631			
40	Lubricator		2	SL1000/1	2	2	4
41	Lubricator protective cap		2	SL1000/76	2	2	4
42	Steering lever stud nut		4	SL222/9	4	4	8

PARTS LIST FOR S82 STEER AXLE (WITH KNORR DISC BRAKE)
AXLE ASSEMBLY No.25546
ILLUSTRATION No.F47

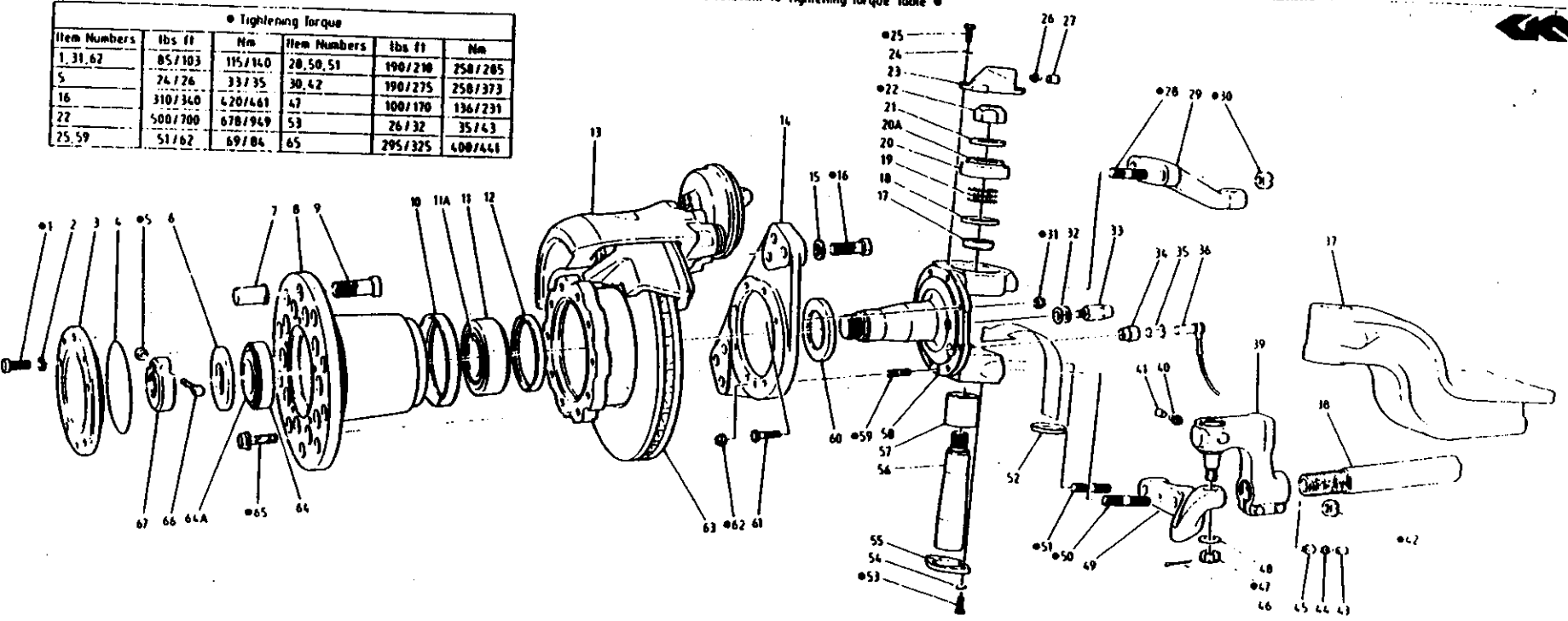
Item No	Description		Qty.Per Axle	Part No.	Recommended Spares Holding Per 25 Axles	50 Axles	100 Axles
43	Lubricator protective cap		2	SL1000/76	2	2	4
44	Lubricator		2	SL1000/1	2	2	4
45	Lubricator extension		2	SL1000/31	-	-	2
46 - 48	Supplied within item 39						
49	Bottom lever RH		1	F4651/7	1	2	3
	Bottom lever LH		1	F4651/8	1	2	3
50	Steering lever stud - long		2	SL778/18	2	2	4
51	Steering lever stud - short		2	SL778/13	2	2	4
52	Swivel pin seal (upper) ('V' ring)		2	LS1060/64A	6	12	24
53	Bottom cap setscrew		4	SL553/4	4	4	8
54	Spring washer		4	SL242/4	4	4	8
55	Swivel bottom cap		2	5430/34	2	4	6
56	Swivel pin		2	7786/14	2	4	6
57	Swivel pin bottom bush		2	7786/20	2	4	6
58	Swivel assembly LH		1	SF4651/2	1	2	3
	Swivel assembly RH		1	SF4651/3	1	2	3
59	Brake caliper bracket stud		10	SL785/110	10	10	20
60	Hub bearing distance piece		2	7816/26	2	4	6
61	Brake caliper bracket bolt		6	SL795/68	6	6	12
62	Brake caliper bracket nut		10	SL228/6	10	10	20
63	Brake disc		2	F4651/88	2	4	6
64	Hub Inner bearing cup	Kit no.	2	SL289/293	4	8	16
64A	Hub Inner bearing cone	17899/2	2	SL289/294	4	8	16
65	Brake disc capscrew		20	ML7916/50X	20	20	40
66	Bearing nut pinch bolt		2	SL553/17	2	4	6
67	Hub bearing nut		2	7786/77A	2	4	6

Notes

Drawn by D J Highton February '94

Annotations relevant to Tightening Torque Table ●

● Tightening Torque					
Item Numbers	lbs ft	Nm	Item Numbers	lbs ft	Nm
1,31,62	85/103	115/140	20,50,51	190/210	258/285
5	24/26	33/35	30,42	190/275	258/373
16	310/340	420/461	47	100/170	136/231
22	500/700	678/949	53	26/32	35/43
25,59	51/62	69/84	65	295/325	400/441



S82 DEAD STEER HUB UNIT

Illustration No 147

PARTS AND SERVICE INSTRUCTIONS FOR TS5 HUB UNIT WITH KNORR AIR DISC BRAKE

ILLUSTRATION No.H86

MANUAL SECTION C

PARTS AND SERVICE INSTRUCTIONS FOR TYPE TSS HUB UNIT

DESCRIPTION

The hub unit consists of a stub axle fitted with Knorr air disc brakes.
The hub taper roller bearings are of a generous size and, adjusted by means of a special split nut with pinch bolt arrangement.

SECTION 1 ROUTINE MAINTENANCE

1.1 Hub bearing adjustment

a) An inspection should be made after the first 3,000 miles (4,800 km) and then at intervals of 25,000 miles (40,000km). With the wheels raised they should revolve quite freely without roughness.

b) Hub bearings should have a slight end float movement within the limits 0.0005" to 0.002" when rocked forwards and backwards on axle stub.
See section 8, page B9 if any adjustment is required.

SECTION 2 TO REMOVE HUB UNIT

2.1 Chock the appropriate wheels.
2.2 Whilst road wheels are still on ground, loosen wheel nuts (7 posn.) slightly.
2.3 Raise vehicle, remove road wheel nuts and remove road wheels.
2.4 Disconnect air line from brake caliper (12).
2.5 Remove brake caliper setscrews with washers (15 & 14) then lift off brake caliper assembly (12).
2.6 Remove hub cap setscrews and washers (1 & 2).
2.7 Remove hub cap (3) with 'O' ring (4) then discard 'O' ring.
2.8 Remove hub bearing pinch bolt nut (5) and bolt (26), then remove hub bearing nut (27) along with bearing washer (6).
2.9 Remove hub (8) complete with its bearings (11/11A & 24/24A) and oil seal (12) then lift off outer bearing cone (24A).
2.10 Remove oil seal (12) and inner bearing cone (11A) from hub (8).
2.11 Drive out hub bearing cups (11 & 24) from hub (8).
2.12 If hub bearing distance piece (oil seal wear sleeve) (16) shows signs of wear or corrosion it must be removed and replaced with a new part.

SECTION 3 TO ASSEMBLE THE HUB

Prior to assembly, pack hub bearing (11/11A & 24/24A) with lithium base grease (Shell Retinax LX or equivalent) using a bearing packer or manually knead grease between rollers, race and cage.

3.1 Fit hub bearing distance piece (16) onto swivel stub axle (17).

3.2 Fit inner and outer hub bearing cups (11 & 24) onto their bores in hub (8).

3.3 Fill hub cavity with lithium base grease (Shell Retinax LX or equivalent) from outer bearing shoulder to centre line of inner bearing cone as shown in figure no.1.

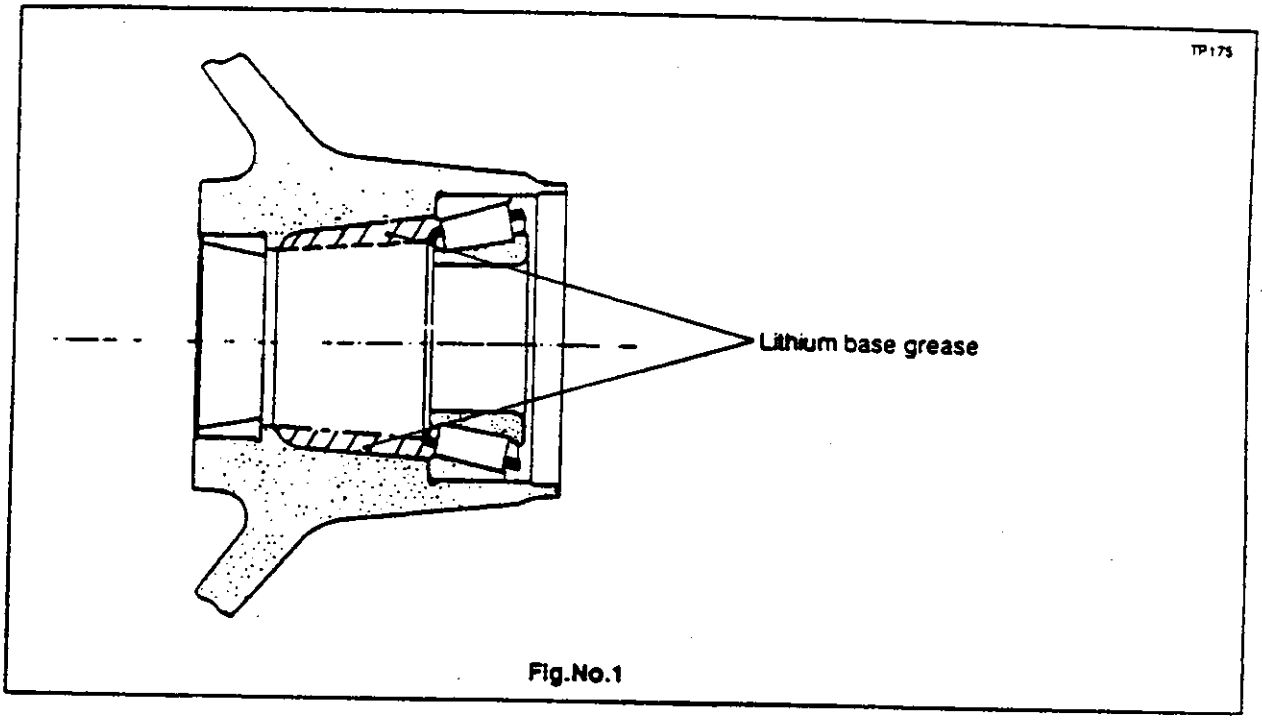


Fig.No.1

3.4 Fit inner hub bearing cone (11A) into its cup in hub (8).

3.5 Press hub oil seal (12) into position in hub (8) using a suitable bumper tool which locates on outer part of seal to prevent damage on assemble.

3.6 Fit hub assembly onto swivel stub axle (17).

3.7 Fit outer bearing cone (24A) into its cup (24).

3.8 Fit hub bearing washer and hub bearing nut (6 & 27). Tighten nut hard with the aid of a small tommy bar just enough to take up bearing slack.

3.9 Fit hub bearing nut pinch bolt and nut (26 & 5), tighten finger tight.

SECTION 3 TO ASSEMBLE THE HUB Cont.

3.10 Adjust hub 'End Float' as follows :-
Rotate hub and using a hide faced mallet, knock hub backwards and forwards along axle arm to 'Shock Load' and thus settle bearings in position.

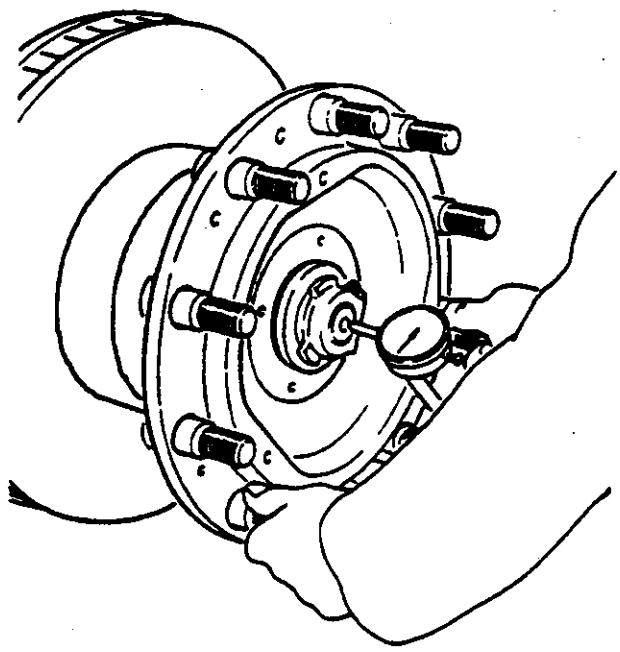
Note :- It is very important to rotate and ' shock load ' the hub because :-

a) The rotation serves to ensure that bearing rollers settle into running in their correct tracks.
b) The ' Shock Load ' is to ensure that bearings are seated correctly up to their abutment shoulders.
Test the tightness of hub bearing nut (27), if loose, re-tighten hard.
Rotate and ' Shock Load ' the hub again.
Continue this procedure until hub bearing nut (27) cannot be tightened further after hub has been rotated and ' Shock Loaded '.
Back off hub bearing nut (27) by approximately 30° then rotate again and knock hub outward along axle arm to release bearings.
Mount a dial indicator on hub flange (8) and position its pointer on end of axle stub (see fig. no. 2.).
Rock the hub backwards and forwards along axle arm, taking a reading on dial indicator.

The correct ' End Float ' is between limits 0.0005 " to 0.002 " (0.013 to 0.050 mm).

Tighten the hub bearing pinch bolt nut (5) to 24 - 26 lbs ft. (33 - 35Nm.).

Check the ' End Float ' again, using above procedure, and adjust if outside specified limits.



To adjust hub 'End Float'

Fig.No.7.

SECTION 3 TO ASSEMBLE THE HUB Cont.

3.11 Smear the inside of hub cap (3) with a thin coating of grease as indicated in lubrication section A, page no.A3.

3.12 Clean hub cap and hub mating faces (3 & 8) with Loctite Superclean Safety Solvent no.706 or other suitable chlorinated solvent then apply a complete 1/8" bead of Loctite Superflex (black) around mating face of hub cap (3). See fig. no. 3.

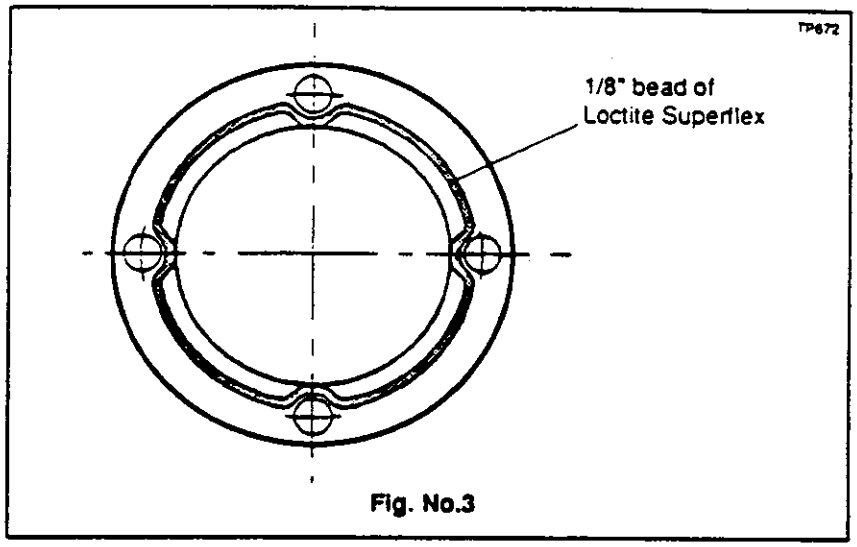


Fig. No.3

3.13 Fit hub cap along (3) within 5 minutes of applying sealant then secure with hub cap setscrews and washers (1 & 2) tightening setscrews to 85 - 103 lbs. ft. (115 - 140Nm.).

SECTION 4 FINAL ASSEMBLY

4.1 Refit road wheels, securing with wheel nuts (7 posn.). Tighten nuts to 475 - 525 lbs. ft. (644 - 712 Nm).

4.2 Lower vehicle to ground.

4.3 Remove chocks and jacks.

TORQUE TABLE FOR TS5 HUB UNIT WITH KNORR AIR DISC BRAKE

Item No	Description	Torque
1	Hub cap setscrew	85 - 103 lbs ft (115 - 140 Nm)
5	Hub pinch bolt nut	24 - 26 lbs ft (33 - 35 Nm)
7	Wheel nut	475 - 525 lbs. ft. (644 - 712 Nm)
15	Brake caliper setscrew	310 - 340lbs. ft. (420 - 461Nm.)
18	Axle stub stud	95 - 105lbs.ft. (129 - 142Nm.)
20	Axle Stub nut	210 - 256lbs.ft. (285 - 347Nm.)
21	Caliper bracket nut	85 - 103lbs.ft. (115 - 140Nm.)
22	Caliper bracket nut	85 - 103lb (115 - 14(
59	Caliper bracket stud	51 - 62lbs. ft. (69 - 84Nm.)

PARTS LIST FOR TS5 HUB UNIT (WITH KNORR DISC BRAKE)

CUSTOMER PREVOST

AXLE ASSEMBLY No.33537

ILLUSTRATION No. H86

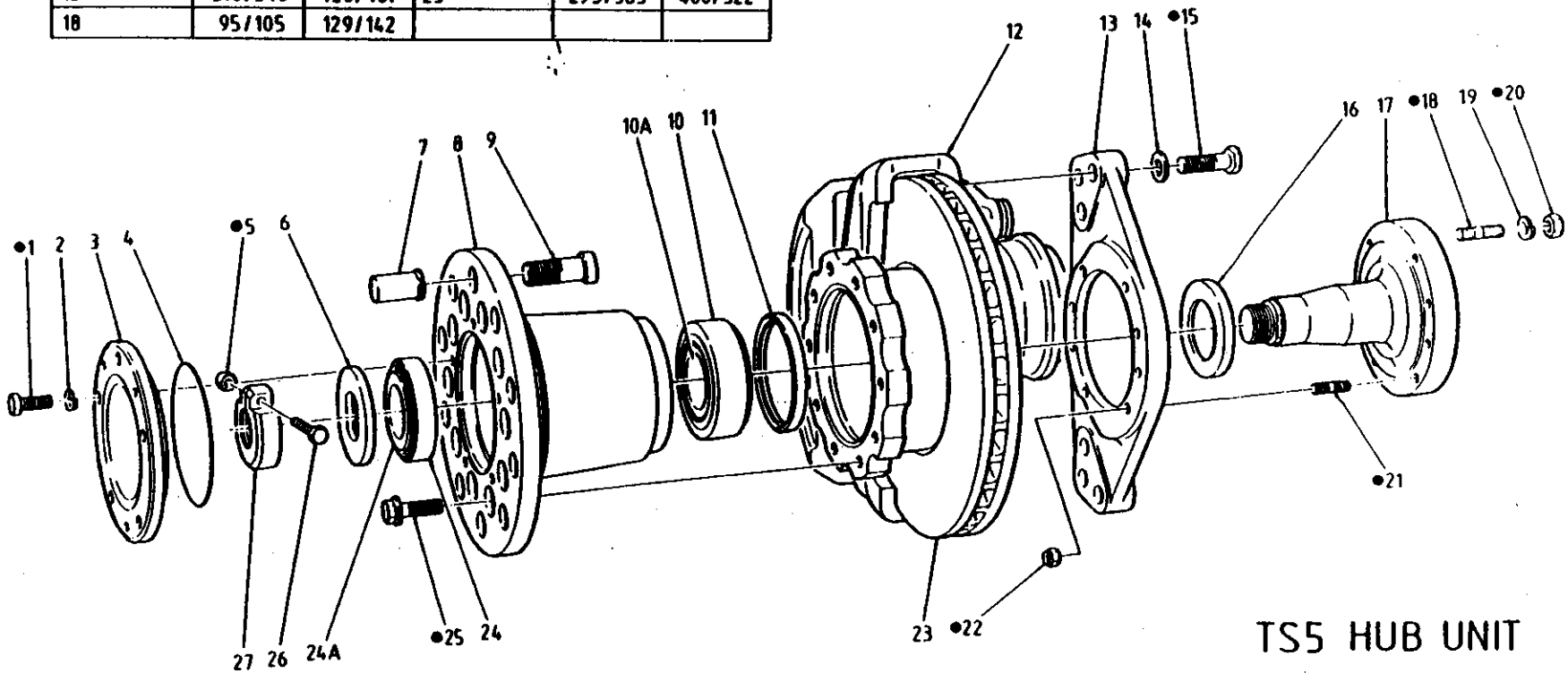
Item No	Description		Qty.Per Axle	Part No.	Recommended Spares Holding Per 25 Axles	50 Axles	100 Axles
1	Hub cap setscrew		8	ML6012/35S	8	8	16
2	Hub cap spring washer		8	ML5712/1	8	8	16
3	Hub cap		2	F4651/29	2	4	6
4	Hub cap 'O' ring		2	R9434/149	2	2	4
5	Bearing nut pinch nut		2	SL228/4	2	4	6
6	Hub bearing 'D' washer		2	7786/30	2	4	6
7	Wheel stud protective cover		20	R8484/161			
8	Hub		2	F4651/28	2	4	6
9	Wheel stud RH		10	F4561/75	30	60	120
	Wheel stud LH		10	F4561/76	30	60	120
10	Hub inner bearing cup	Kit no.	2	SL289/293	4	8	16
10A	Hub inner bearing cone	17899/2	2	SL289/294	4	8	16
11	Hub oil seal		2	7786/32	4	8	16
12	Brake caliper RH		1	SM486/4K	1	2	3
	Brake caliper LH		1	SM486/5K	1	2	3
13	Caliper mounting bracket		2	R9855/65	2	4	6
14	Brake caliper retaining washer		12	N70040	12	12	24
15	Brake caliper retaining bolt		12	N70251	12	12	24
16	Hub bearing distance piece		2	7816/26	2	4	6
17	Axle stub		1	R9855/238	1	2	3
18	Chassis mounting stud		16	SB6416/42V	16	16	32
19	Chassis mounting washer		16	ML5716/1	16	16	32
20	Chassis mounting nut		16	ML5016/X	16	16	32
21	Brake caliper bracket stud		16	SL785/110	16	16	32
22	Brake caliper bracket nut		16	SL228/6	16	16	32
23	Brake disc		2	F4651/88	2	4	6
24	Hub outer bearing cup	Kit no.	2	SL289/107	4	8	16
24A	Hub outer bearing cone	17899/1	2	SL289/286	4	8	16
25	Brake disc capscrew		20	ML7916/50X	20	20	40
26	Bearing nut pinch bolt		2	SL553/17	2	4	6
27	Hub bearing nut		2	7786/77A	2	4	6

Notes

Drawn by D J Highton February '94

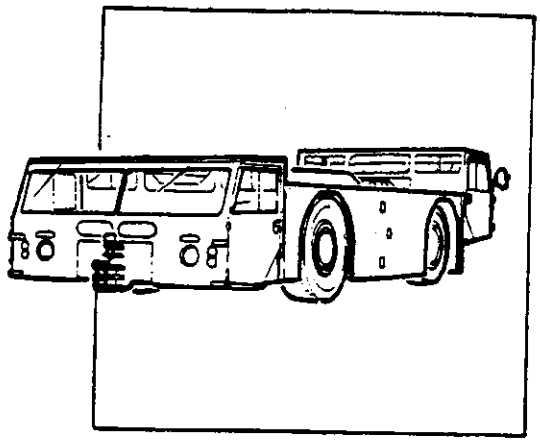
Annotations relevant to Tightening Torque Table ●

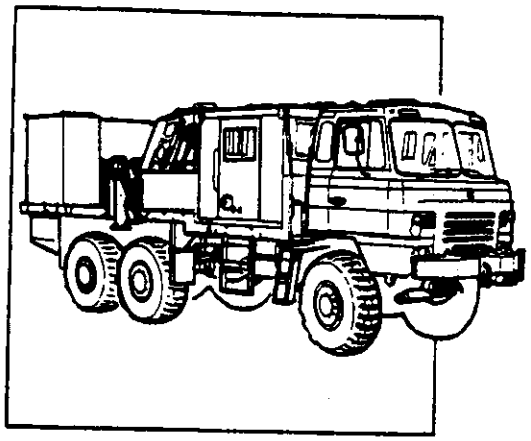
● Tightening Torque					
Item Numbers	lbs ft	Nm	Item Numbers	lbs ft	Nm
1, 22	85/103	115/140	20	210/256	285/347
5	24/26	33/35	21	51/62	69/84
15	310/340	420/461	25	295/385	400/522
18	95/105	129/142			

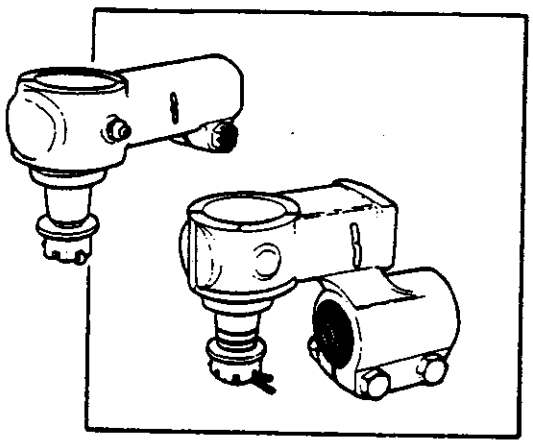


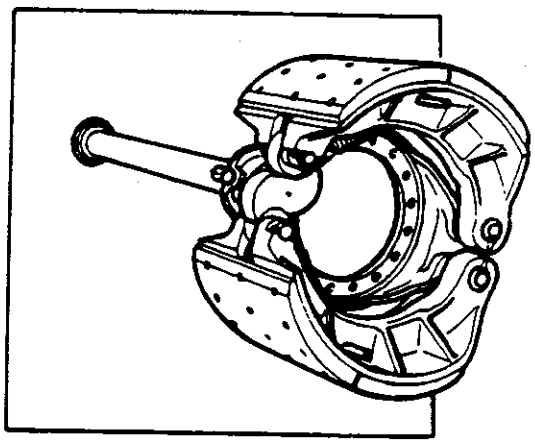
TS5 HUB UNIT

Illustration No H86









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